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United States Department of Agriculture, FOREST SERVICE,

GIFFORD PINCHOT, Forester.

INSTRUCTIONS FOR RECORDING OBSERVATIONS ON LEAFING, FLOWERING, AND FRUITING OF FOREST TREES.

(PHENOLOGICAL OBSERVATIONS.)

Observations should be made only on important forest trees. Whenever botanical names are known these should be given, and if there is any doubt as to species samples should be sent for identification.

The enclosed forms contain blank spaces for describing the locality and for recording observations. These should all be carefully filled out, one sheet being used for each species under observation. Records may be kept of as many species as desired, and additional forms will be sent at any time upon request.

Observations should not be based on a single tree, but should include a considerable number of trees of each species. Care should be taken, however, to observe average trees, which are not conspicuously earlier or later than others of the same species in the same locality. They should also represent average situations, so that trees should not be selected which grow on very precipitous slopes, in narrow or closed ravines, along dry roadsides, along rocky, exposed ridges, or close to houses and stables. Forest trees should be chosen rather than trees growing in the open or on the edge of the forest.

A few definite suggestions will explain more clearly the different phases of tree life to be recorded and the method of making the observations.

1. SWELLING OF BUDS.—The date on which a majority of the buds are enlarged, but still within the winter scales. The buds should be those of the outer part of the tree, since those near the trunk tend to develop prematurely because of reflected heat.

2. BURSTING OF BUDS.—The date on which a majority of the buds expose the tender green of the new leaves from between the winter scales.

3. BEGINNING OF LEAFING OUT.—The date on which the first leaves have straightened themselves out from the twisted form they had in the bud, and turned their upper surfaces upward.

4. GENERAL LEAFING OUT.—The date on which a majority of the leaves, especially the outer ones, have turned their upper surfaces upward.

5. BEGINNING OF BLOSSOMING.—The date on which the first few flowers open and expose the reproductive organs (stamens or pistils).

6. GENERAL BLOSSOMING.—The date on which the trees are in full bloom (stamens or pistils easily visible in a majority of the opened flowers).

7. CHANGE IN COLOR OF FOLIAGE.—The date on which a majority of the leaves first begin to change color from the green of summer. Care should be taken not to confuse premature coloration resulting from drought or disease with the normal autumn change of color.

8. BEGINNING OF LEAF FALLING.—The date on which the trees begin to shed their leaves freely.

9. END OF LEAF FALLING.—The date on which the trees are practically bare of leaves.

10. BEGINNING OF SEED RIPENING.—The date on which the first seeds or fruits ripen on several of the trees. Diseased trees frequently ripen their fruits prematurely, and care must be taken not to record dates for such abnormal trees. No hard and fast general rule can be laid down by which to determine when a fruit is ripe. In succulent fruits, color is a good indication of ripeness; in many others, the fruit is ripe when it falls at a slight jar; in conifers, when the cone begins to turn brownish the seeds should be examined, and if plump, brownish, and not milky when cut open they are ripe.

11. GENERAL SEED RIPENING.—The date on which the greater part of the seed on most of the trees is ripe.

12. BEGINNING OF SEED FALLING.—The date on which the seeds first begin to fall in considerable quantities from most of the trees.

13. END OF SEED FALLING.—The date on which the seeds have practically all fallen.

14. QUANTITY OF SEED.—This can not be expressed absolutely, but should be indicated by some such general terms as "scarce," "medium," and "abundant."

15. QUALITY OF SEED.—This relates to the portion of the seed which is capable of germination, and should be expressed by some such terms as "poor," "fair," and "good." The condition of the seed can usually be determined by cutting open a number of the seeds for examination. If most of the seeds are apparently perfectly sound, the quality should be described as good; while if many of them are hollow, shriveled up, or damaged by insects or disease the quality should be described as poor.

The records obtained should be sent to the Forest Service once a year when all of the spaces in the blank form have been filled out. Thus, if the record begins with the falling of the leaves, it should be returned the next year just before the falling of the leaves begins. Duplicate records may be retained by observers and will be of interest in comparing the dates recorded from year to year.

Possibly in some species all of the desired observations can not be satisfactorily made by an inexperienced observer and may have to be

omitted; but the records in all cases should be as complete and, above all, as accurate as possible.

Since any observation is without value unless the species for which it is made is known with absolute certainty, it is urgently requested that, whenever there is the least doubt as to the species, specimens be sent to the Forester, Washington, D. C., for identification. It is not enough, for example, to know that a tree is an oak, a hickory, or a maple; the question is, what kind of an oak, hickory, or maple it is. Twigs with buds, leaves, flowers, or fruit are usually sufficient definitely to identify the species, and information will be gladly furnished. Persons who wish to learn to distinguish between different kinds of forest trees will have an excellent chance to increase their knowledge by volunteering for these observations. In this way an accurate knowledge of the tree species in any region can be acquired.

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